Borregaard

TECHNICAL DATA SHEET

1,3-DIAMINO-2-PROPANOL (DAP)

DAP is synthesized by reacting Epichlorohydrin with ammonia in alkaline environment by adding sodium hydroxide. Afterwards, the product undergoes a series of purification steps.

Description

Product name: 1,3-diamino-2-propanol

Synonyms: DAP, DAPRO

CAS No: 616-29-5

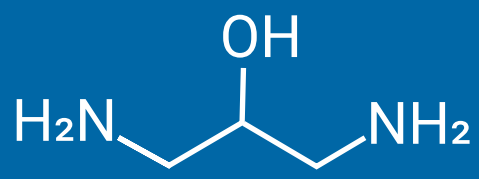
EC No: 210-474-2

REACH Reg. No.: 01-2119980710- 37-0000

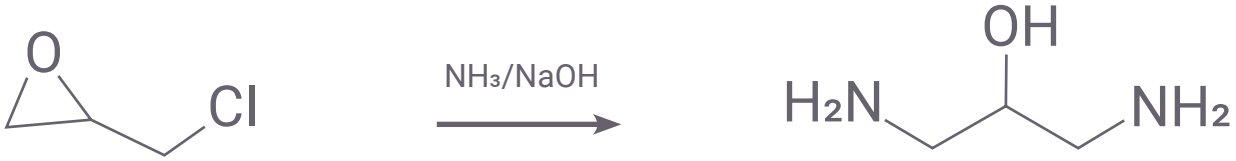
Formula: $C_3H_{10}N_2O$

Molecular weight: 90,12

STRUCTURE



ROUTE OF SYNTHESIS



Epichlorohydrin

1-3-Diamino-2-propanol

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www.borregaard.com

Enterprise No.
NO 895 623 032 vat

PHYSICAL AND CHEMICAL PROPERTIES

DAP may solidify at temperatures below 40 degrees Celsius.

TYPICAL QUALITY

Parameter	Specification
Assay	NLT 90.0 % (w/w)
Water Content (KF titration	NMT 8.0 % (w/w)
Assay + Water content	NLT 98.0 % (w/w)
GC analysis (by area percent)	
2,3-diamino-1-propanol (approximate RRT 1.04)	NMT 0.8 %
Dimer (approximate RRT 2.07)	NMT 1.1 %
Other impurities, each	NMT 0.5 %
Sum of all impurities [1)]	NMT 2.0 %

1) Sum of all impurities includes RRT 1.04 and RRT 2.07

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GC INSTRUMENT CONDITION

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PACKAGING AND TRANSPORT

DAP can be supplied in heated ISO containers as well as in IBC containers.

STORAGE AND SHELF LIFE

Store in a dry, cool, well-ventilated area.

LEAD TIME

Production is run on a campaign basis depending on customer needs.

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SAFETY

CLP-classification: Acute Tox. 4;H302 Skin Corr. 1B;H314 Skin Sens. 1;H317

Most serious harmful effects: Harmful if swallowed. Causes severe skin burns and eye damage. May cause an allergic skin reaction.

CERTIFICATIONS

Borregaard Pharma Intermediates is certified in accordance with several standards:

- ISO 9001 Quality Management
- ISO 14001 Environmental Management
- ISO 50001 Energy Management

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BSE/TSE
No material of animal origin is used during the manufacture of DAP. This includes all starting substance, reagents and solvents.

KOSHER
Not formally verified.

HALAL
DAP does not contain any ingredient of animal origin. Pork origin or parts there of (enzymes, hair, bacon, etc.) are not used in the manufacturing of the product. No processing aid, additive or carrier of animal origin has been used in the production of this product.

ALLERGENS
Our product is free from allergens.

GMO
DAP does not contain material of Genetically Modified Organism origin.
The above material is not manufactured using any materials derived from GMOs.
The above material was not exposed to any material of GMO origin including media, Lubricants and plasticizers during manufacture.

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ABOUT US

Borregaard has one of the world's most advanced and sustainable biorefineries.

By using natural, sustainable raw materials, Borregaard produces advanced and environmentally friendly biochemicals that can replace oil-based products. Borregaard also holds strong positions within ingredients and fine chemicals.

Borregaard employs 1100 man-years in plants and sales offices in 16 countries throughout Europe, Americas, Asia and Africa.

BORREGAARD - PHARMA INTERMEDIATES

Borregaard's business segment Pharma Intermediates manufactures pharma intermediates for global pharmaceutical and related markets. We are located in Sarpsborg, Norway where we have two large commercial plants.

Our core products are 3-Chloro-1,2-propanediol (CPD), 3-Amino-1,2-propanediol (APD), 3-Methylamino-1,2-propanediol (MAPD) and 1,3-Diamino-2-propanol (DAP). Our expertise allows us to concentrate on such applications as contrast media and advanced intermediates. Our plants are operating 24/7 365 days a year, and Borregaard ensures our customers a stable manufacturing process which gives high quality products.

SUSTAINABILITY

Borregaard Pharma Intermediates has a high focus on continuous improvements to reduce our environmental impact, lower our energy consumption and increase the capacity in our plants. Our energy comes from renewable Norwegian hydroelectric power and internally generated steam generated from burning household garbage and waste from our biorefinery.

Life cycle analysis of comparable processes has proved CPD, APD and MAPD from Borregaard to have a substantially better environmental profile compared to Asian producers mainly due to waste treatment and not using steam/energy originating from coal.

Up to 50% of carbon in final formulated contrast media may have its origin from Borregaard – and we are in a unique position if our customers in future would like to enforce strict sustainability. Half of the amount of carbon in formulated contrast media like Iohexol originates from Borregaard products - we are well positioned if our contrast media customers show increased interest in sustainability.

The key raw material for CPD, APD and MAPD is oil-based epichlorohydrin. Epichlorohydrin can be produced from renewable raw materials and Borregaard is running annual campaigns using renewable epichlorohydrin.

For more info please visit www.borregaard.com

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